Recent Results of UV-B Measurements in Brazil

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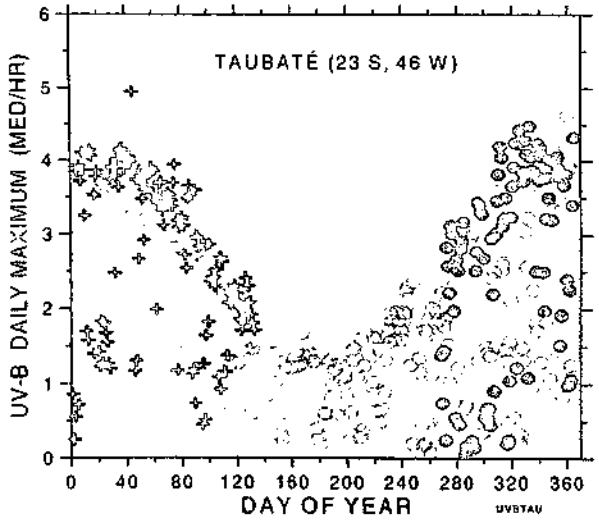
A network of UV-B meters has been organized and distributed in Brazil in association with studies of the stratospheric ozone layer and in an effort to increase public awareness of excess UV-B radiation on the human skin. In order to make UV-B measurements more accessible to the people, the UV Index has been calculated in specific cases. Three different kinds of UV-B meters are used. The most sofisticated instruments can measure very narrow spectral ranges, and they can do it almost unattended by operators. Simultaneously they measure stratospheric ozone, Sulfur dioxide and Nitrogen dioxide; these are the Brewer spectrophotometers, six of which are presently part of the network. A second class of instruments is simpler but can also make spectral measurements at different wavelengths; the network has now three GUV meters in this category. And in the third class of instruments there are the UV-Biometers, which are UV-B integrating instruments, less expensive and very convenient for different applications and interpolation purposes. There are presently 8 such instruments in operation. The whole network has recently also expanded to neighbor collaborating countries, Chile and Bolivia. Southern Chile is very interesting for observations of the Antarctic Ozone Hole, and its consequences in terms of increased UV-B; and in Bolivia, the high Andes mountains receive high doses of UV-B and UV-A, because of the altitude above sea level. We will show some of these UV results, and show differences in various regions of Brazil.

INTRODUCTION

A series of unpublished data for a period of about two years are shown below. Figure 1 shows measured UV-B radiation at Taubaté (23 S, 46 W), in the state of S.Paulo, in terms of the daily maximum power in MED/hr. In the winter period, when the solar zenith angle is the least favorable for large intensities, the observed power is in the range of 1.5 Med/hr. This value reaches up to almost three times this minimum, to about 4.5 Med/hr in Summer. The lower values reflect the passage of cloud systems over the observer.

A second example of UV measurements is shown in Figure 2 for UV-A, also measured in the Taubate area. Note that the difference between maxima and minima is now much smaller than in the previous case. The power is now measured in mW/cm2. The minimum observed is near 4 mW/cm2, whereas the maximum Summer value is 6 mW/cm2.

The UV-B index is calculated from the measured intensities. Shown in Table 1 are UV-B indices for some important Brazilian cities. More details of these computations will be discussed in the presentation.



⇐Fig. 1. UV-B radiation measured in the Taubate area, S.Paulo state, Brazil, 1995-1997.

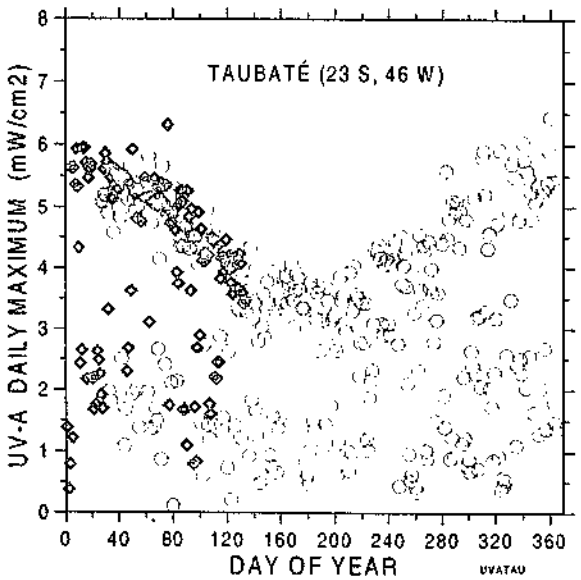


Fig. 2. Measured intensities of UV-A in the area of Taubaté, state of S.Paulo, Brazil, 1996-1997.

Valores típicos de UV-B index medidos para várias cidades do Brasil

CIDADES DO BRASIL	UV-B INDEX JANEIRO (VERÃO)	UV-B INDEX JULHO (INVERNO)
Natal, RN	8,7	9,0
Salvador, BA	9,8	8,5
Belo Horizonte, MG	11,5	7,0
São Paulo, SP	11,8	3,9
Rio de Janeiro, RJ	11,9	4,5
Blumenau, SC	11,5	3,5
Porto Alegre, RS	9,5	3,0

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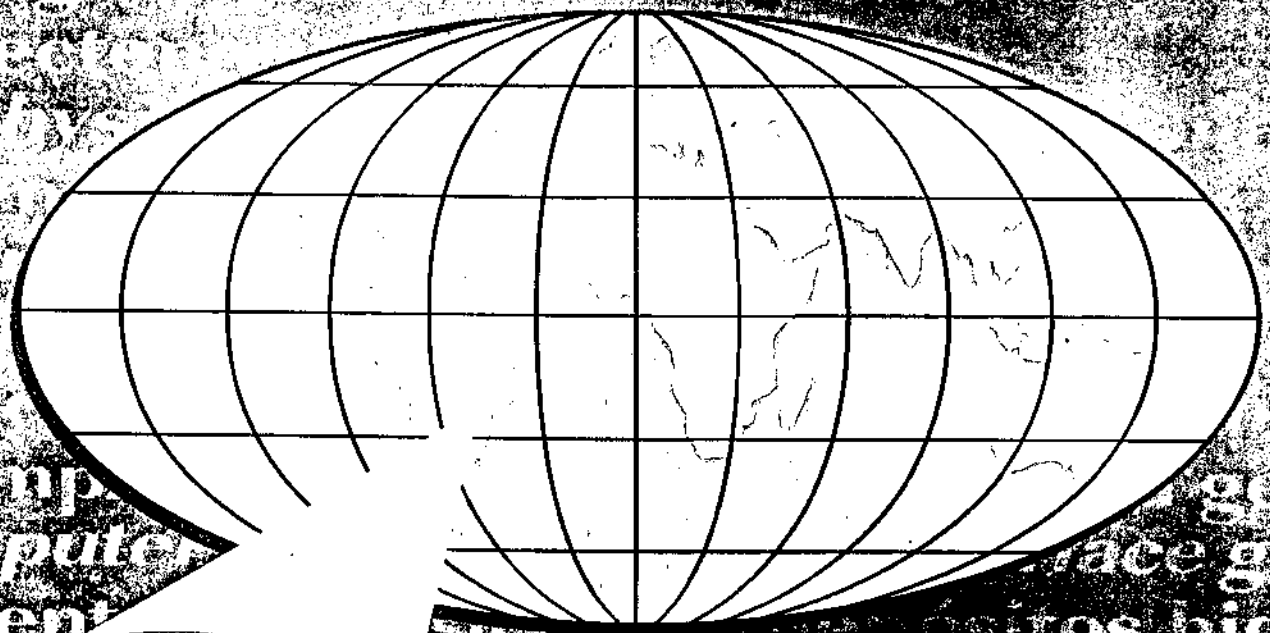

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RESUMOS EXPANDIDOS

EXPANDED ABSTRACTS

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